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9/54, 9/82 NAAM, Alison; 856 Burr Street, Davis, CA 95616 (US).
- (21) International Application Number: **PCT/US99/22231** (74) Agents: **SCHWEDLER, Carl, J. et al.**; Calgene LLC,
1920 Fifth Street, Davis, CA 95616 (US).
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- (71) Applicant: **CALGENE LLC [US/US]**; 1920 Fifth Street, (88) Date of publication of the international search report:
Davis, CA 95620 (US). 18 January 2001
- (72) Inventors: **LASSNER, Michael, W.**; 721 Falcon Avenue, For two-letter codes and other abbreviations, refer to the "Guid-
Davis, CA 95616 (US). **EMIG, Robin, A.**; 901 Sara Court, ance Notes on Codes and Abbreviations" appearing at the begin-
Vacaville, CA 95687 (US). **RUEZINSKY, Diane, M.**; 849 ning of each regular issue of the PCT Gazette.



WO 00/18889 A3

(54) Title: SEQUENZES OF PUTATIVE PLANT ACYLTRANSFERASES

(57) Abstract: By this invention, novel nucleic acid sequences encoding for acyltransferase related proteins are provided, wherein said acyltransferase-like protein is active in the transfer of a fatty acyl group from a fatty acyl donor to a fatty acyl acceptor. Also considered are amino acid and nucleic acid sequences obtainable from AT-like nucleic acid sequences and the use of such sequences to provide transgenic host cells capable of producing modified lipid content and composition.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 99/22231

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N9/10 C12N9/54 C12N9/82

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	NORBERG A. ET AL.: "Chemical detection of natural peptides by specific structures. Isolation chicken galanin by monitoring for its N-terminal dipeptide, and termination of the amino acid sequence." FEBS LETT 1991 AUG 19;288(1-2):151-3, XP000916139 abstract; figure 2 --- -/--	1,9-18, 20

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

7 July 2000

Date of mailing of the international search report

04.10.00

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INTERNATIONAL SEARCH REPORT

Inter. Appl. No.
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	BROWN A P ET AL: "IDENTIFICATION OF A CDNA THAT ENCODES A 1-ACYL-SN-GLYCEROL-3-PHOSPHATE ACYLTRANSFERASE FROM LIMNANTHES DOUGLASII" PLANT MOLECULAR BIOLOGY,NL,NIJHOFF PUBLISHERS, DORDRECHT, vol. 29, no. 2, 1 October 1995 (1995-10-01), pages 267-278, XP002000905 ISSN: 0167-4412	1
X	abstract; figure 3	9-18,20
Y	ISHIZAKI O ET AL: "CLONING AND NUCLEOTIDE SEQUENCE OF COMPLEMENTARY DNA FOR THE PLASTID GLYCEROL-3-PHOSPHATE ACYLTRANSFERASE FROM SQUASH" FEBS (FEDERATION OF EUROPEAN BIOCHEMICAL SOCIETIES) LETTERS 1988, vol. 238, no. 2, 1988, pages 424-430, XP000916289 ISSN: 0014-5793	1
X	abstract; figure 2	9-18,20
Y	JOHNSON T C ET AL: "NUCLEOTIDE SEQUENCE OF ACYL-ACYL CARRIER PROTEIN GLYCEROL-3-PHOSPHATE ACYLTRANSFERASE FROM CUCUMBER" PLANT PHYSIOLOGY (BETHESDA) 1992, vol. 99, no. 2, 1992, pages 771-772, XP000919121 ISSN: 0032-0889	1
X	abstract	9-18,20
Y	LASSNER M W ET AL: "LYSOPHOSPHATIDIC ACID ACYLTRANSFERASE FROM MEADOWFOAM MEDIATES INSERTION OF ERUCIC ACID AT THE SN-2 POSITION OF TRIACYLGLYCEROL IN TRANSGENIC RAPESEED OIL" PLANT PHYSIOLOGY,US,AMERICAN SOCIETY OF PLANT PHYSIOLOGISTS, ROCKVILLE, MD, vol. 109, no. 4, 1 January 1995 (1995-01-01), pages 1389-1394, XP002027767 ISSN: 0032-0889	1
X	abstract; figure 1	9-18,20
X	NAGIEC, M. MAREK ET AL: "A suppressor gene that enables Saccharomyces cerevisiae to grow without making sphingolipids encodes a protein that resembles an Escherichia coli fatty acyltransferase" J. BIOL. CHEM. (1993), 268(29), 22156-63, XP000644683	9-18,20
Y	abstract; figure 2	1
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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 99/22231

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	NISHIDA I. ET AL.: "The gene and the RNA for the precursor to the plastid-located glycerol-3-phosphate acyltransferase of Arabidopsis thaliana." PLANT MOL BIOL 1993 JAN;21(2):267-77, XP000916240	1
X	abstract; figure 2	9-18,20
Y	WO 96 24674 A (GENE SHEARS PTY LTD ;SLABAS ANTONI RYSZARD (GB); BROWN ADRIAN PAUL) 15 August 1996 (1996-08-15)	1
X	abstract; figure 1	9-18,20
A	YOKOI SHUJI ET AL: "Introduction of the cDNA for Arabidopsis glycerol-3-phosphate acyltransferase (GPAT) confers unsaturation of fatty acids and chilling tolerance of photosynthesis on rice." MOLECULAR BREEDING JUNE, 1998, vol. 4, no. 3, June 1998 (1998-06), pages 269-275, XP000909905 ISSN: 1380-3743	1
X	abstract	9-18,20

INTERNATIONAL SEARCH REPORT

national application No.
PCT/US 99/22231

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

See additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1, partially 9-18, 20, 21

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

1. Claims: 1, partially 9-18, 20, 21
relating to Seq Id No 127
2. Claims: 2, partially 9-18, 20, 21
relating to Seq Id No 128
3. Claims: 3, partially 9-18, 20, 21
relating to Seq Id No 129
4. Claims: 4, partially 9-18, 20, 21
relating to Seq Id No 132
5. Claims: 5, partially 9-18, 20, 21
relating to Seq Id No 130
6. Claims: 6, partially 9-18, 20, 21
relating to Seq Id No 133
7. Claims: 7, partially 9-18, 20, 21
relating to Seq Id No 131
8. Claims: 8, partially 9-18, 20, 21
relating to Seq Id No 134
9. Claims: partially 9-18, 20, 21, 22
relating to Seq Id No 1
10. Claims: partially 9-18, 20, 21, 22
relating to Seq Id No 10
11. Claims: partially 9-18, 20, 21, 22
relating to Seq Id No 12

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

12. Claims: partially 9-18, 20, 21, 22
relating to Seq Id No 14
13. Claims: partially 9-18, 20, 21, 22
relating to Seq Id No 16
14. Claims: partially 9-18, 20, 21, 23
relating to Seq Id No 3
15. Claims: partially 9-18, 20, 21, 22
relating to Seq Id No 5
16. Claims: partially 9-18, 20, 21, 22
relating to Seq Id No 7
17. Claims: partially 9-18, 20, 21, 22
relating to Seq Id No 18
18. Claims: Invention No. 18-126: Claims 9-22 all partially
each individual invention relating to Seq Id No. 24 to Seq
Id. 126, respectively

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 99/22231

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
W0 9624674 A	15-08-1996	AU 4669096 A	27-08-1996
		CA 2212570 A	15-08-1996
		CA 2235267 A	24-04-1997
		EP 0808368 A	26-11-1997
